Kansas Air Quality Report 2006-2007

Kansas Department of Health & Environment (KDHE)

Healthy Kansans living in safe and sustainable environments.

Table of Contents

Healthy Kansas living in safe and sustainable environments.

A Message from the Director of the Division of Environment

Dear Reader:

The Kansas Department of Health and Environment is pleased to provide you with the latest Kansas Air Quality Report. The purpose of this annual report is to inform the public and local stakeholders of air monitoring results and emissions trends for the previous calendar year. These trends help us to understand the current conditions of our air quality, successful pollution reduction strategies, and can help to identify areas where improvement is needed. The report is one of many efforts our department makes to keep the citizens of Kansas informed about air quality issues that affect us daily. Throughout this report you will also find information on the history of air quality, policy and regulations, air pollutant definitions, causes and effects of air pollution, and air quality improvement tips.

John Mitchell,
Director, Division of Environment

Kansas Air Quality Overview

Kansas is fortunate to experience good overall air quality. However, the presence of air pollutants can pose a threat to clean air. At the same time, meteorological conditions greatly affect the concentration of pollutants at a particular location, as well as the rate of dispersion of pollutants. We, for the most part, enjoy our changing seasons even when summer ushers in hot, dry weather. Along with the hot weather comes conditions that lead to the formation of a ground-level ozone, a pollutant that is particularly harmful to human health. It is easily observed that conditions change in Kansas, moment to moment. There isn't much we can do about crazy Kansas weather, however, an awareness of air pollution and what we can do to reduce it goes a long way to protect public health and sustain our quality of life in Kansas.

Air pollution is generated by our modern day to day activities, like driving and using electricity. Our central location in the country and prevailing southerly winds mean that we need to be concerned about pollutants that are transported in and out of Kansas as well as home grown air pollution impacting the air we breathe.

The Kansas Air Quality Program monitors and tracks air pollutants across Kansas, to assure that health-based air quality standards, set by the Environmental Protection Agency (EPA), are not exceeded. Data is used to develop the appropriate regulatory or outreach strategies to reduce air pollution levels and improve our air quality. The program is also responsible for issuing air emission permits for facilities and assuring compliance with state and federal regulations for air pollutants.

The Kansas Air Quality Program is housed in the Bureau of Air and Radiation, which is within the Kansas Department of Health and Enviroment. Our collective mission is to protect the public and the environment from radiation and air pollution. Our goals address issues commonly known to cause serious potential harm to public health, our environment and threaten our economic stability. These goals, to conserve air quality, control air pollution, and protect the public health and safety from radiation, begin by providing quality service and information to our customers. Knowledge is power with respect to air quality and information is available on our Web site at: www.kdheks.gov/bar.

Protecting Kansas Air Quality

The Bureau of Air & Radiation (BAR)

What does BAR do to protect air quality???

The mission of the Bureau of Air and Radiation is to protect the public from the harmful effects of air pollution and prevent damage to the environment from releases of air contaminants. The bureau strives to achieve this mission through monitoring, permitting, planning, education, and compliance activities. These activities are conducted by four sections of the bureau and four local agencies. The bureau also carries out a comprehensive radiation protection program. Specific information on Radiation can be found at: www.kdheks.gov/bar.

What do the various sections do to protect Air Quality???

Monitoring & Planning Section

The Air Monitoring and Planning Section administers the air monitoring and modeling program and the emissions inventory program in accordance with provisions in the Clean Air Act. In cooperation with three local agencies, section staff operates an air monitoring network, which provides air quality data from 24 sites around the state. The monitoring data is analyzed to determine compliance with federal standards and to evaluate air quality trends. Staff members also conduct an annual emissions inventory of pollutants emitted from permitted facilities and other sources for the entire state. Staff members who conduct air quality modeling use the emission inventory data. Modeling allows for a better understanding of the causes of air pollution and aids in development of pollution reduction strategies in targeted areas. Pollution reduction strategies are incorporated into state and regional plans to protect public health and the environment from the negative effects of air pollution. Other activities include providing outreach on air quality improvement, indoor air quality education, and the generation of this report.

Air Operating permit & Construction Section

The Bureau of Air and Radiation (BAR) Air Permitting Section (APS) is responsible for reviewing air quality control permit applications and issuing permits for air emissions in accordance with state and federal air quality regulations. Air quality control permits are issued with the goals of conserving air quality, controlling air pollution, and providing quality service to all of our customers.

The APS issues construction permits and approvals prior to construction or modification. The construction permit application allows the APS to determine if or what requirements need to be established for the facility (or emission source) when equipment is constructed or modified. Whether a construction permit or an approval is required depends on the potential-to-emit (PTE) of the proposed construction or modification. The proposed construction or modification is reviewed to assure that potential emissions from the new or modified equipment will comply with the requirements of state and federal regulations. The construction permit program is also the vehicle by which Kansas implements several other federal programs applicable to new or modified sources that have been delegated to the state to administer. These include the New Source Performance Standards (NSPS), 40 CFR Part 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61 and Part 63. Part 63 is based on maximum achievable control technology, and is usually referred to as the MACT regulations.

BAR also issues operating permits. The potential-to-emit of the facility determines the type of operating permit required, if any. The two types of operating permits are Class I (also known as a Title V permit) and Class II (also known as a federally enforceable state operating permit or FESOP). The Kansas Class I operating permit program satisfies the requirements of the federal Title V program and closely parallels the requirements of 40 CFR Part 70. A Class I operating permit is required for major sources of air pollution and provides a complete listing of all air quality regulatory requirements in one document. The Kansas Class II operating permit program provides a method to reduce the potential-to-emit of a source below the major source thresholds and thereby allows the source to operate without a Class I operating permit.

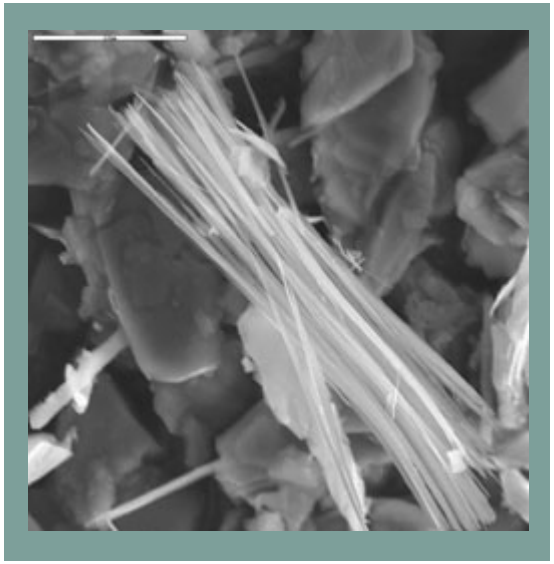
The Department of Air Quality of the Unified Government of Wyandotte County assists in the permitting process by issuing construction and operating permits in Wyandotte County.

Air Compliance & Enforcement Section

The ACES section is responsible for determining compliance, and if needed, issuing enforcement actions due to non-compliance. Air emissions sources in Kansas are subject to state and federal air quality regulations. Depending on the type and quantity of emissions, sources are required to obtain permits and conduct activities such as testing, monitoring, recordkeeping and reporting to demonstrate compliance. The ACES staff uses a combination of inspections, performance test evaluations, report reviews, technical assistance, and enforcement actions to ensure facilities comply with the applicable air quality regulations and permits. Staff from KDHE's district offices, as well as the four cooperating local agencies, conduct inspections and investigate complaints and forward the results to the ACES staff for review and response. The ACES staff oversees performance tests through approval of proposed test plans, on-site observation of performance tests, and review and approval of the reported test results. Periodic reports are reviewed by ACES staff for evaluation of compliance. The ACES staff also provides public outreach and compliance assistance. When a source violates an air quality standard, ACES staff issues formal enforcement actions and work with the source to return them to compliant regulatory status.

Radiation, Asbestos, & Right to Know

The Radiation and Asbestos Control Section protects the public and the environment from the harmful effects of manmade radiation, natural radiation and asbestos. This includes administering the radiological emergency response program, the environmental radiation surveillance program, the Kansas Radon Program, the radioactive materials and X-Ray control programs, the asbestos program and the Right-to-Know program. The radiological emergency response program provides planning, training and operational radiological response to all radiation incidents in the State of Kansas. The environmental radiation surveillance program detects, identifies, and measures any radioactive material released to the environment by the Wolf Creek Generating Station and provides oversight and guidance in the clean-up of other sites contaminated with radioactive materials. The Kansas Radon Program performs outreach and education to the citizens of Kansas on the harmful effects of radon gas and how to test and fix the problem. The radioactive materials and X-Ray control programs regulate the use of ionizing radiation in Kansas. The asbestos program monitors the removal of asbestos from building renovations and demolition projects. This program also issues licenses to asbestos workers to ensure trained personnel conduct appropriate removal activities. Finally, the Right-to-Know program receives information regarding chemical storage and releases and makes such information available to the public.



Tremolite Asbestos:US Geological Survey

Clean Air Act & the National Ambient Air Quality Standards

Clean Air Act

The Clean Air Act is a federal law covering the entire country. However, states, tribes and local governments do a lot of the work to meet the Act's requirements. The Clean Air Act (CAA) is a federal act originally written in 1970 and is the driving force for all air pollution legislation in the United States. The primary goal is to protect human health. The CAA serves as the base for a coordinated federal and state regulation system. Under the CAA, all 50 states are responsible for completing and implementing a State Implementation Plan, or SIP. SIPs provide guidance for a state to achieve the National Ambient Air Quality Standards (NAAQS) in the CAA, or if standards are met, how to maintain good air quality. The NAAQS were established in the original CAA of 1970 and revised by the EPA in 1990 with standards intended to result in improved air quality nationwide.

National Ambient Air Quality Standards

The National Ambient Air Quality Standards give states targets for measuring pollutants considered harmful to public health and the environment. Pollutants in this category, called **criteria pollutants** include: Carbon monoxide, lead, oxides of nitrogen, particulate matter, ground-level ozone, and sulfur oxides. The NAAQS are summarized by criteria pollutant begining on page nine. There are primary and secondary standards for each criteria pollutant, as shown in table one on page seven. **Primary standards** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. **Secondary standards** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

During 2006, the Kansas Air Monitoring Program tracked five of the six criteria pollutants. Monitoring for lead was phased out in 1998 due to the significant drop in measured values caused by eliminating lead compounds from gasoline. The remaining five criteria pollutants 2006 monitoring results for Kansas are detailed in the Air Quality Monitoring section begining on page 14.

EPA Region 7 in Kansas City, KS

National Ambient Air Quality Standards (*NAAQS*) 2006

Pollutant	Primary Standards	Secondary Standards	Averaging Times
Carbon Monoxide	9 ppm (10 mg/m^3)	None	8-hour(1)
	35 ppm (40 mg/m^3)	None	1-hour(1)
Lead	1.5 µg/m^3	Same as Primary	Quarterly Average
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Same as Primary	Annual (Arithmetic Mean)
Particulate Matter (PM_{10})	Revoked(2)	Revoked(2)	Annual(2) (Arith. Mean)
	150 µg/m^3	Same as Primary	24-hour(3)
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Same as Primary	Annual(4) (Arith. Mean)
	35 µg/m^3	Same as Primary	24-hour(5)
Ozone	0.08 ppm	Same as Primary	8-hour(6)
	0.12 ppm	Same as Primary	1-hour(7) (Applies only in limited areas)
Sulfur Oxides	0.03 ppm	-------	Annual (Arith. Mean)
	0.14 ppm	-------	24-hour(1)
	-------	0.5 ppm (1300 µg/m^3)	3-hour(1)

Table one

1) Not to be exceeded more than once per year.

(2) Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM10 standard in 2006 (effective December 17, 2006).

(3) Not to be exceeded more than once per year on average over 3 years.

(4) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community oriented monitors must not exceed 15.0 ìg/m3.

(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 ìg/m3 (effective December 17, 2006).

(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1, as determined by appendix H.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact (EAC) areas.

Sources of Air Pollution

Sources of air pollution are divided up into four categories; Point Sources, Area Sources, On-road Mobile Sources and Non-road Mobile Sources. **Point sources** are large, stationary sources of emissions. Examples of point sources are natural gas compressor stations, petroleum refineries, and grain processing or storage facilities. **Area sources** are smaller, generally more numerous sources whose individual emissions do not qualify them as point sources. Although area sources release relatively small amounts of air pollutants on an individual basis, because of the numbers of these sources, their emissions as a whole are significant. Examples include household solvents and paints, motor vehicle refueling, and residential fuel combustion. **On-road Mobile sources** are sources of air pollution that are not stationary, and can typically be driven on a highway such as cars, trucks, buses and motorcycles. **Non-road Mobile Sources** are also not stationary, but typically are not driven on highways. Example of Non-road Mobile Sources include lawnmowers, locomotives, and tractors.

Point Source

On-road Mobile Source

Area Source

Non-road Moble Source

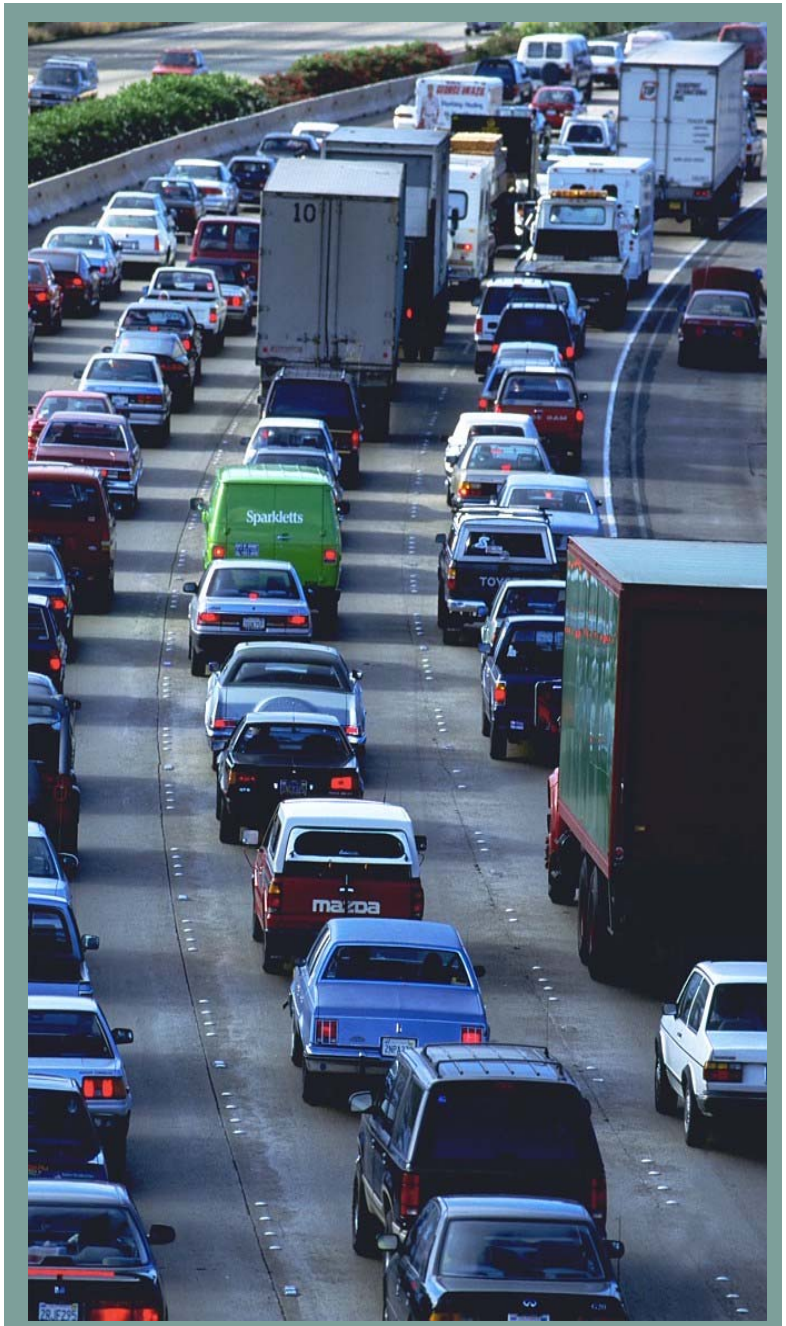
Critieria Pollutants in Detail

Carbon Monoxide (CO)

- Colorless, odorless gas formed when carbon in fuel is not burned completely
- Component of motor vehicle exhaust, contributes about 56 percent of all CO emissions nationwide
- In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust
- Other sources include industrial processes (metals processing and chemical manufacturing) and natural sources (forest fires)
- Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors

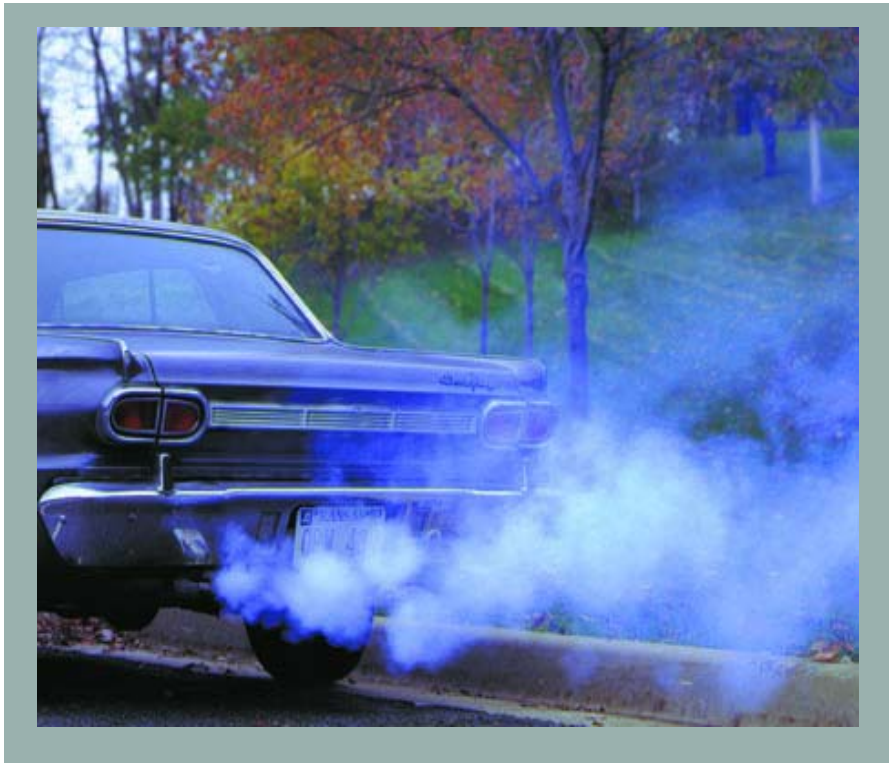
Chief Causes of Concern

- Acute effects are due to the formation of carboxyhemoglobin in the blood, which inhibits oxygen intake
- Causes fatigue in healthy people and chest pain in people with heart disease even at low levels
- At higher concentrations, impaired vision and coordination; headaches; dizziness; confusion; nausea and in extreme cases CO exposure can be fatal
- Contributes to the formation of ground-level ozone, the main component of smog, which has detrimental effects of our health and the environment



Nitrogen Oxides (NO_x)

- A group of highly reactive gases, all containing nitrogen and oxygen in varying amounts
- Some NO_x along with particles in the air can often be seen as a reddish-brown layer over many urban areas, but many are colorless and odorless
- Forms when fuel is burned at high temperatures, such as a combustion process
- Sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NO_x can also be formed naturally

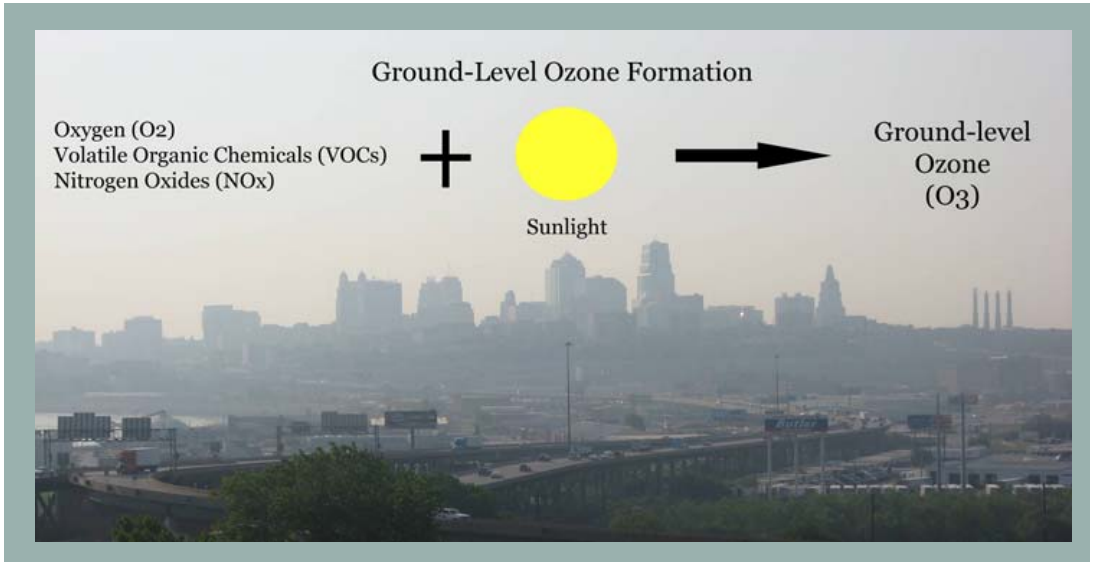


Chief Causes of Concern

- One of the main ingredients involved in the formation of ground-level ozone, which can trigger serious respiratory problems
- Reacts to form nitrate particles, acid aerosols, as well as NO_2, which also cause respiratory problems
- Contributes to formation of acid rain
- Contributes to nutrient overload that deteriorates water quality
- Contributes to atmospheric particles, that cause visibility impairment noticeable in national parks
- Reacts to form toxic chemicals
- Contributes to global warming

Ozone (O_3)

- Ozone is a gas that occurs both in the Earth's upper atmosphere (good ozone) and at ground level (bad or ground-level ozone)
- Ground-level ozone is created by chemical reactions between nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight during hot dry weather
- A main ingredient of urban smog
- Sources of NO_x and VOC are industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents



Kansas City, MO Skyline

Chief Causes of Concern

- Areas of Kansas have high levels of ground-level ozone during summer
- Lung irritation that can cause inflammation much like a sunburn
- Wheezing, coughing, pain when taking a deep breathe, and breathing difficulties during exercise or outdoor activities
- Permanent lung damage to those with repeated exposure to ozone pollution
- Aggravates asthma, reduces lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis
- Interferes with the ability of sensitive plants to produce and store food and makes them more susceptible to certain diseases, insects, other pollutants, and harsh weather
- Damages the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, national parks, and recreation areas; and reduces crop yields

Particulate Matter (PM)

- A mixture of solid particles and liquid droplets found in the air
- Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small, they can only be detected using an electron microscope
- Can be made up of hundreds of different chemicals
- Particles that are less than 2.5 micrometers in diameter are known as “fine” particles; those larger than 2.5 micrometers, but less than 10 micrometers, are known as “coarse” particles
- Primary particles are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires
- Others form in complicated reactions in the atmosphere of chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industrial activities, and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the country

Chief Causes for Concern

- Particle pollution can cause coughing, wheezing, and decreased lung function even in otherwise healthy children and adults
- Fine particles are easily inhaled deep into the lungs where they may accumulate, react, be cleared, or absorbed
- Fine particles can remain suspended in the air and travel long distances
- Some of the pollutants which form haze have also been linked to serious health problems and environmental damage
- Particle pollution settles on soil and water and harms the environment by changing the nutrient and chemical balance

Sulfur Oxides (SO_x)

- A group of reactive gases, all containing sulfur and oxygen in varying amounts
- Sulfur dioxide (SO_2) is known for its pungent odor and contributes to the formation of acid rain
- SO_x gases form when fuel containing sulfur, such as coal or high sulfur fuel is burned, and when gasoline is extracted from oil, or metals are extracted from ore
- The majority of SO_2 comes from electric utilities that burn coal

Chief Causes for Concern

- Contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases
- Contributes to the formation of acid rain, which damages crops trees, historic buildings, and monuments
- Makes soils, lakes, and streams acidic
- Contributes to the formation of atmospheric particles that cause visibility impairment, most noticeably in national parks
- Can be transported over long distances, thus problems with SO_2 are not confined to areas where it is emitted

Monitoring Air Quality in Kansas

The Kansas air monitoring network provides air quality data from 24 sites around the state. Members of this network include the Bureau of Air and Radiation at KDHE, Wyandotte, Shawnee, and Sedgwick county environmental departments, and the Kansas Department of Wildlife and Parks. Private citizens also collect samples at particulate matter monitors in several locations. Finally, BAR staff provides quality assurance audits at all monitors in the network. Data generated by the Kansas monitoring network is reported on a quarterly basis to the Air Quality System (AQS), a national database maintained by EPA.

The Kansas air monitoring network collects air quality data in order to:

- Educate and inform the public through reports such as this, presentations, and the agency website.
- Evaluate whether Kansas citizens are exposed to air pollutants in concentrations above the National Ambient Air Quality Standards.
- Determine regional and national air pollution trends.
- Determine whether air quality models are working properly by comparing modeled results against monitored results.

Air monitoring data is posted to the Bureau of Air and Radiation (BAR) Web site to inform the public about air quality on a near real-time basis, www.dhe.state.ks.us/aq. This allows people to make informed decisions that reduce exposure to air pollution by staying indoors or reducing physical activity on days when air pollutant levels are elevated. They can also make life style changes such as riding the bus or avoiding unnecessary trips to reduce emissions of harmful air pollutants. Please refer to page 27 for outreach and education programs in BAR.

The Kansas Air Monitoring Network data is also used to assure Kansas is in compliance with the NAAQS. Each year when the data is quality assured by BAR we are able to report any violations of the standards and take action to reduce those air pollutants. Please refer to the Results section on page 17 for 2006 monitoring results for, sulfur dioxide, carbon monoxide, oxides of nitrogen, ground-level ozone, and particulate matter.

The determination of air pollution trends is accomplished by analyzing at least three years of data for each pollutant from each air monitoring site. A mathematical analysis is used to create a "trend line" on a graph. A trend line can be rising (indication a worsening of air quality), falling (indicating improvement in air quality) or remaining stable (indicating no change in air quality).

Finally, BAR staff are able to ascertain that air quality models are working properly by comparing the modeled pollutant concentrations with actual monitoring data. Both a statistical and graphical evaluation of model performance is generally performed often resulting in refinements to modeling inputs, such as emission rates, and subsequent re-testing of the models performance.

Staff Members of the Bureau of Air and Radiation

Curtis State Office Building, Topeka, KS

For 2006, the Kansas Ambient Air Monitoring Network consisted of 24 sampling sites at which the following criteria pollutants were measured:

- Fine particulate matter ($PM_{2.5}$) at 12 sites
- PM_{10} at 12 sites
- Ozone (O_3) at 9 sites
- Meteorological data at 8 sites
- Sulfur dioxide (SO_2) at 6 sites
- Carbon monoxide (CO) at 4 sites
- Nitrogen dioxide (NO_2) at 4 sites
- Fine particle speciation at 2 sites
- Hydrogen sulfide (H_2S) at 2 sites
- Total Suspended Particulate at 1 site
- IMPROVE-protocol at 2 sites

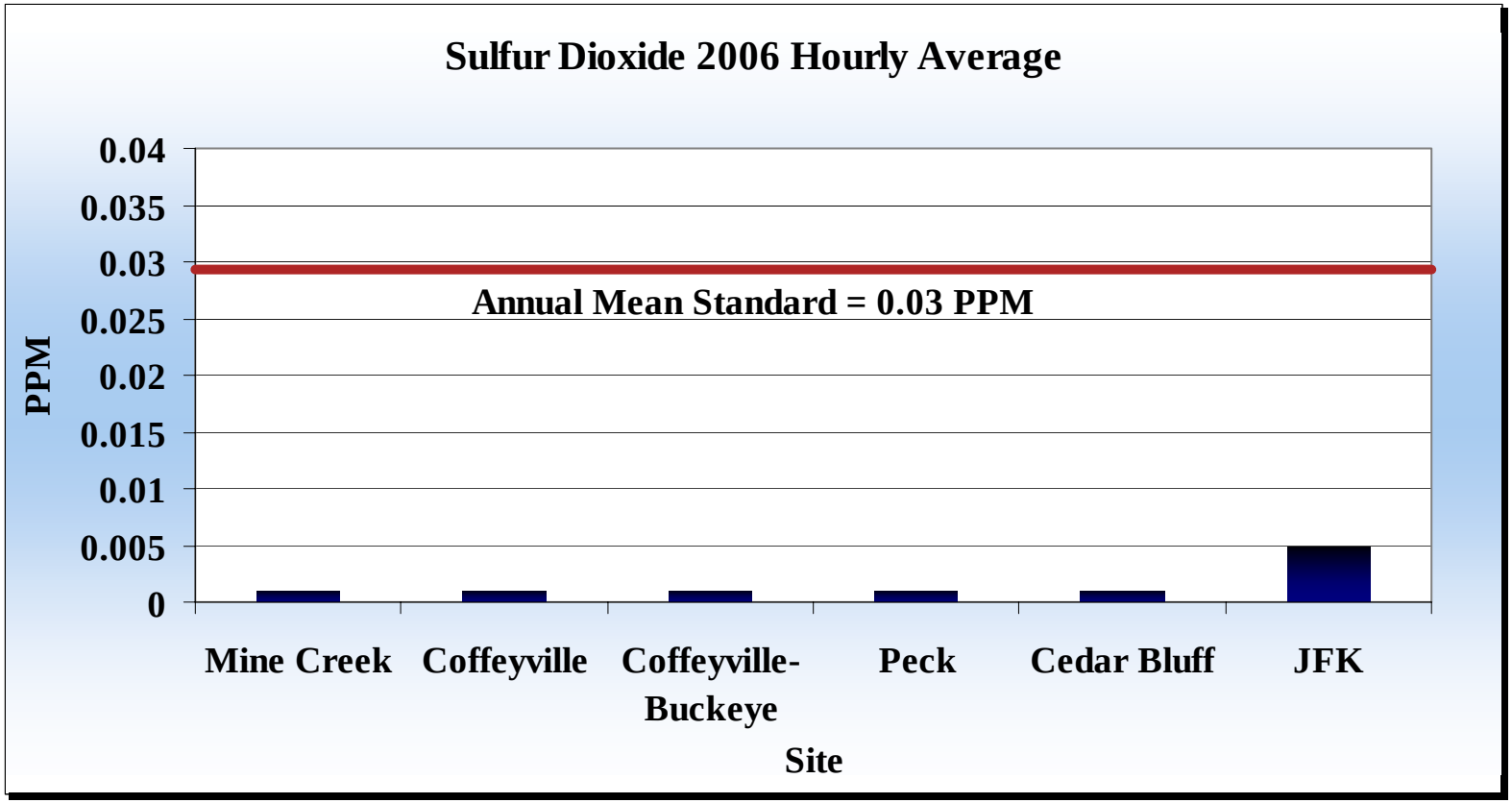
The type and location of the monitors that comprise the network are a result of BAR's effort to serve the many uses for the data described previously. A monitor may be located to evaluate air quality near a specific facility or other potential source of air pollution, or it may serve a broader purpose. The majority of monitors are located in metropolitan areas to collect data representative of exposure of large populations to air pollutants. The ozone and $PM_{2.5}$ monitors are examples of such monitoring locations. The network also includes two monitoring locations designed to evaluate the impacts of long range transport of air pollutants into and through Kansas. The monitoring sites at Peck and Mine Creek serve this purpose. They also provide valuable background data for Wichita and Kansas City, respectively. The monitoring site at Cedar Bluff is located in an area relatively free of air pollutants caused by industry or transportation sources and therefore serves as a baseline or background site for the entire state.

Air Quality Monitoring in Kansas: 2006 Results

Sulfur Dioxide (SO_2) Hourly Average

The primary air quality standard for SO_2 is expressed in three forms: an hourly annual average value; a 3-hour value not to be exceeded more than once per year; and a 24-hour value not to be exceeded more than once per year. Graph number 1 shows the hourly average value concentrations for six sites where SO_2 was monitored in Kansas during 2006; Mine Creek (Linn County), Coffeyville (Montgomery County), Coffeyville-Buckeye (Montgomery County), KC JFK (Wyandotte County), Peck (Sumner County) and Cedar Bluff (Trego County). The annual mean monitoring results for all six sites were well below the hourly standards for SO_2. The Kansas City JFK site showed the highest concentration for the hourly average standard due to the proximity of the site to industrial sources of SO_2.

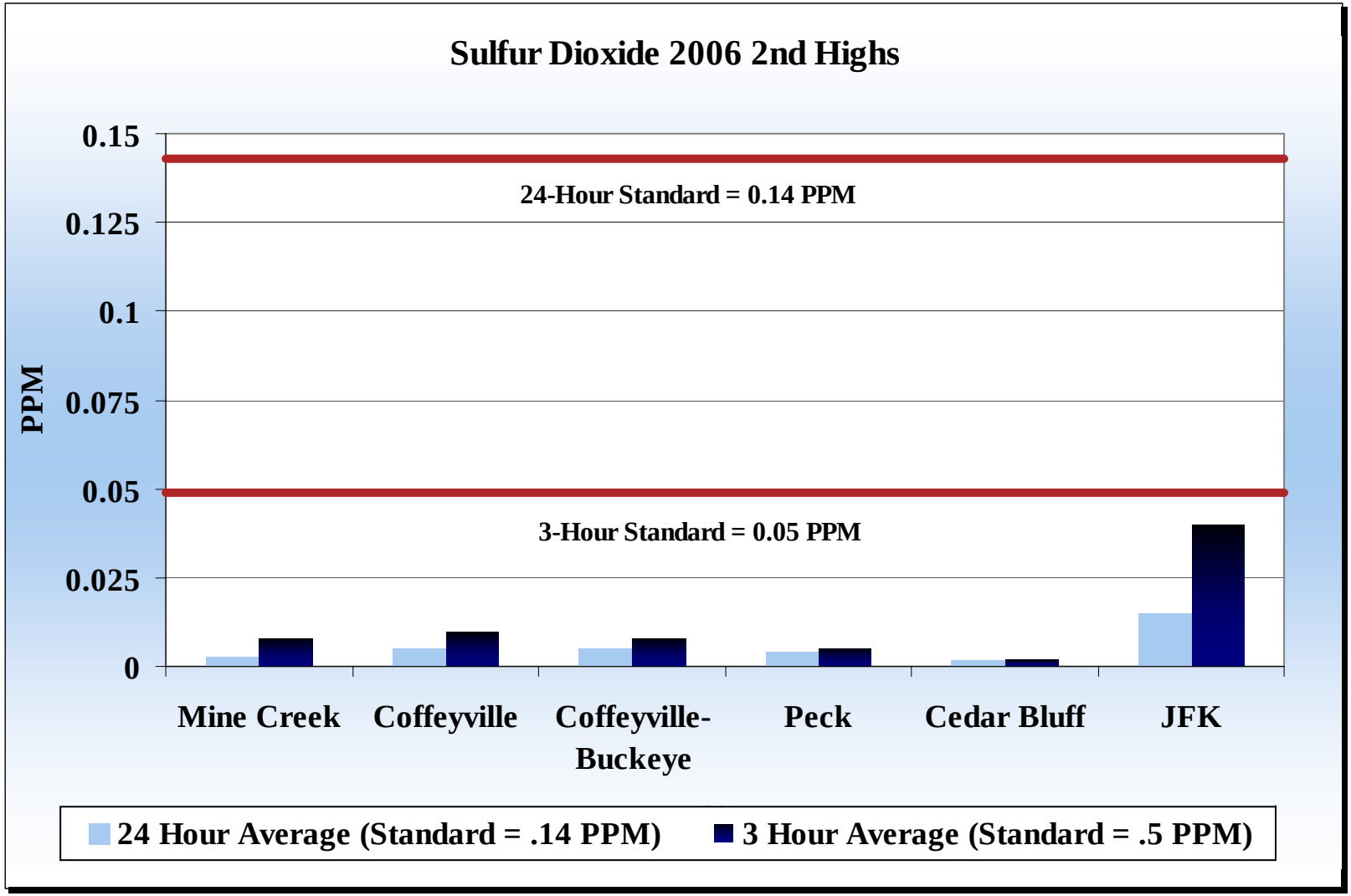
Graph 1



Sulfur Dioxide (SO_2) Three hour and Twenty-four hour Averages

Graph number 2 displays 2006 monitoring results showing the 2nd highest average for both the 24-hour standard and the 3-hour standard. Monitoring results from the JFK site showed the highest concentration for both standards. The 2nd highest average for the 3-hour standard was 0.04 parts per million (ppm) and the 2nd highest average for the 24-hour average standard was 0.02 ppm, both are within the standards set by EPA.

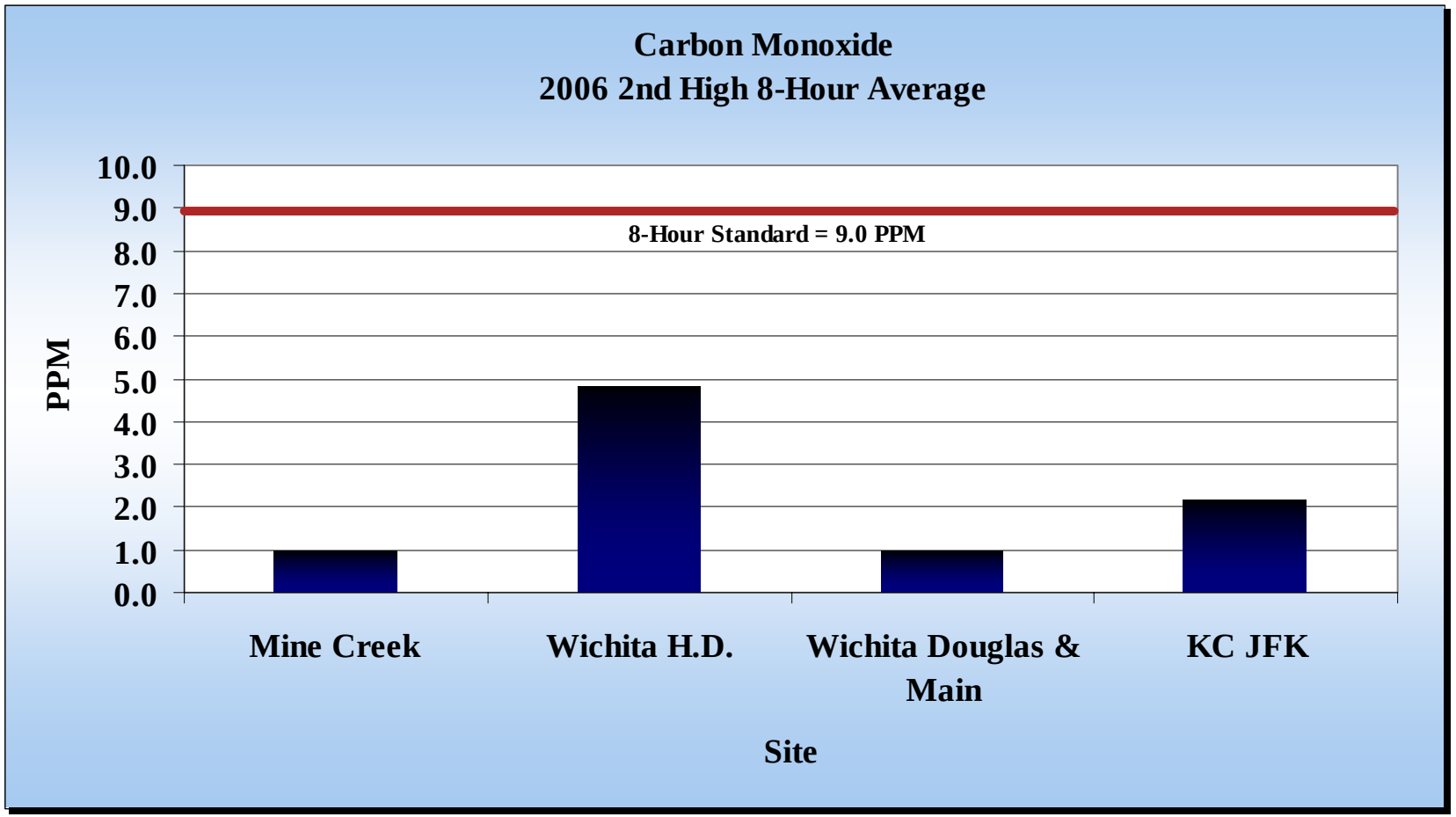
Graph 2



Carbon Monoxide (CO)

The primary air quality standard for CO is expressed in two forms: an 8-hour average value; and a 1-hour average value. Both are not to be exceeded more than once per year. Graph number 3 shows the 2nd highest 8-hour average concentrations for the four sites where CO was monitored in Kansas during 2006. The four CO monitoring sites are Mine Creek (Linn County), Wichita Health Department (Sedgwick County), Douglas and Main (Sedgwick County), and KC JFK (Wyandotte County). All of the sites were well below the 8-hour standard. The 1-hour monitoring results were also well below the 1-hour standard set by EPA.

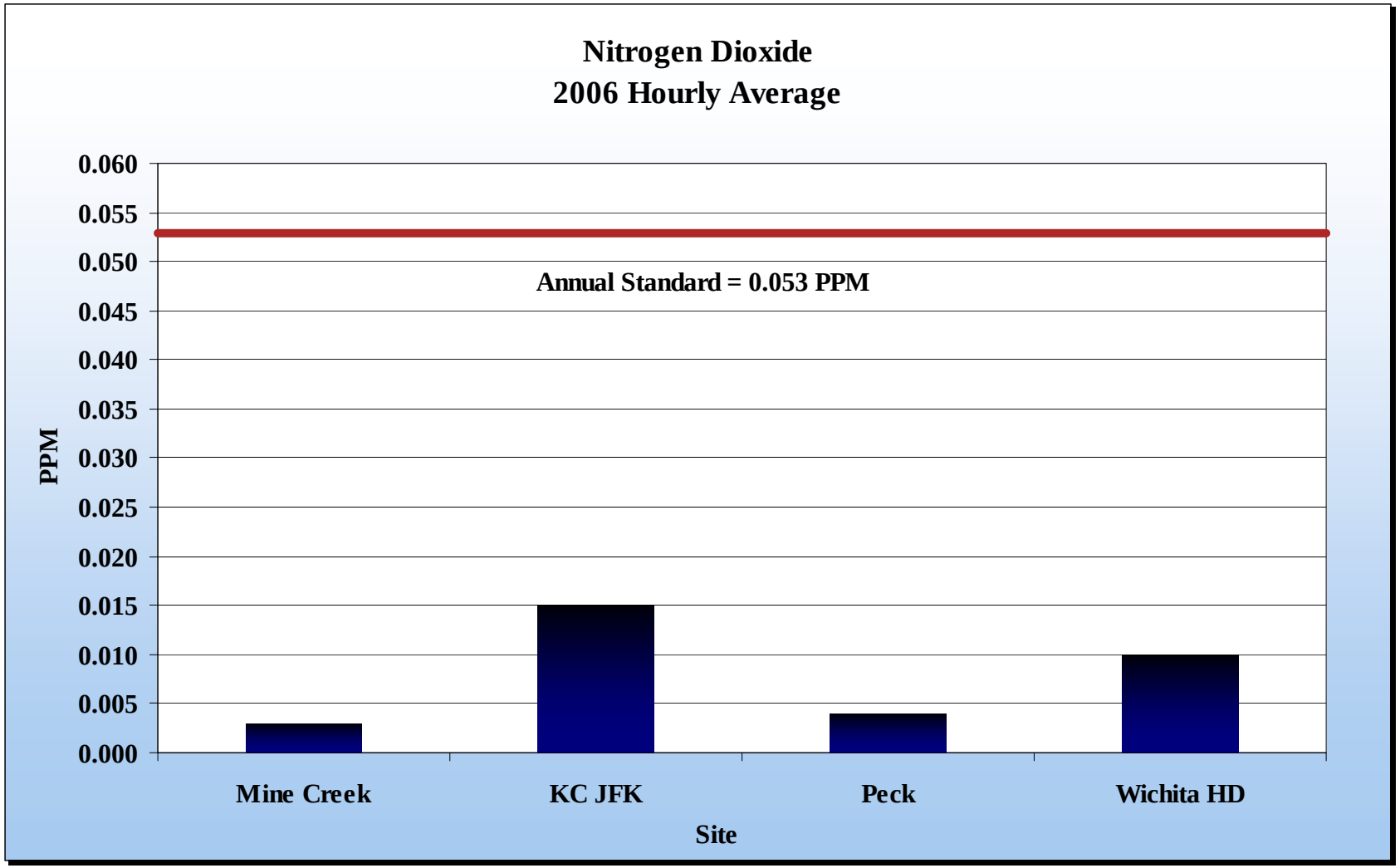
Graph 3



Nitrogen Oxides (NO_x)

The primary air quality standard for NO_2 is expressed in the form of an annual arithmetic mean. Graph number 4 shows the NO_2 monitoring results for the four sites. These sites include Mine Creek (Linn County), KC JFK (Wyandotte County), Peck (Sumner County) and Wichita H.D. (Sedgwick County). All sites were well below the primary air quality standard of 0.053 ppm. The annual average concentration recorded at the KC JFK site was the highest due to its location in a metropolitan area, where commercial, industrial and motor vehicle emissions are more prevalent.

Graph 4

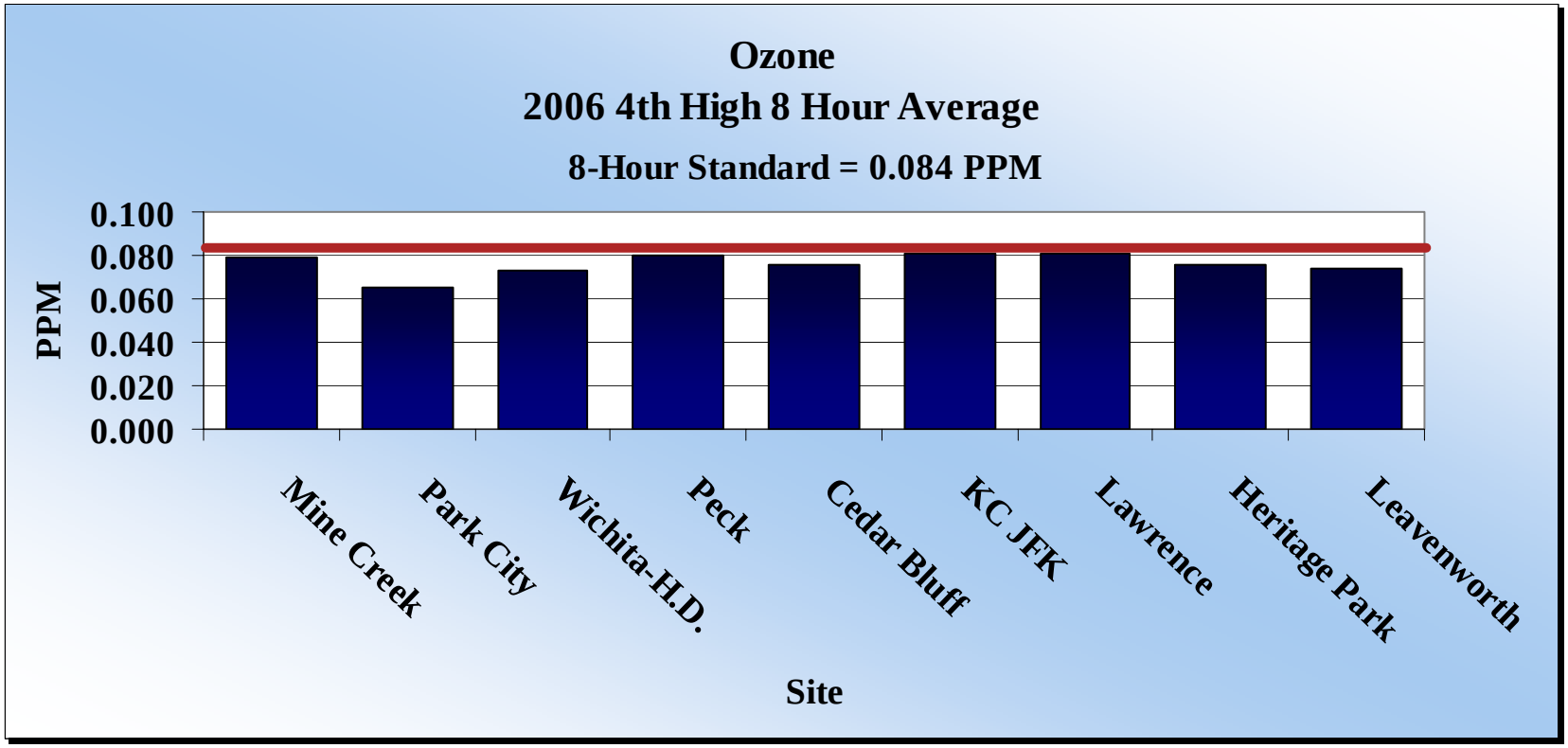


Ozone (O_3)

The primary air quality standard for ozone is for concentrations averaged over 8-hour durations. The standard is expressed in the form of the three-year average of each year's 4th highest concentration. The 8-hour standard is 0.08 ppm. The standard allows for upward rounding of the results. The standard is not exceeded until monitored values exceed 0.084 ppm. When evaluating ozone monitoring results, it is important to remember two points. First, the rounding allowed by the standard means that a value can be slightly above the standard and not be considered a violation. Second, ozone values higher than the standard for one year do not always indicate a violation of the air quality standard. These determinations are made on the basis of three years of data. Graph number 5 shows the 4th highest 8-hour average concentrations for nine sites. The 8-hour results show that some of the monitors are fairly close to the standard. Please see the section on ground-level ozone basics and the section on Kansas City and Wichita Ground-level Ozone for details and consequences of exceeding the EPA standard.

Please see the NAAQS revision for ozone begining on page 24.

Graph 5

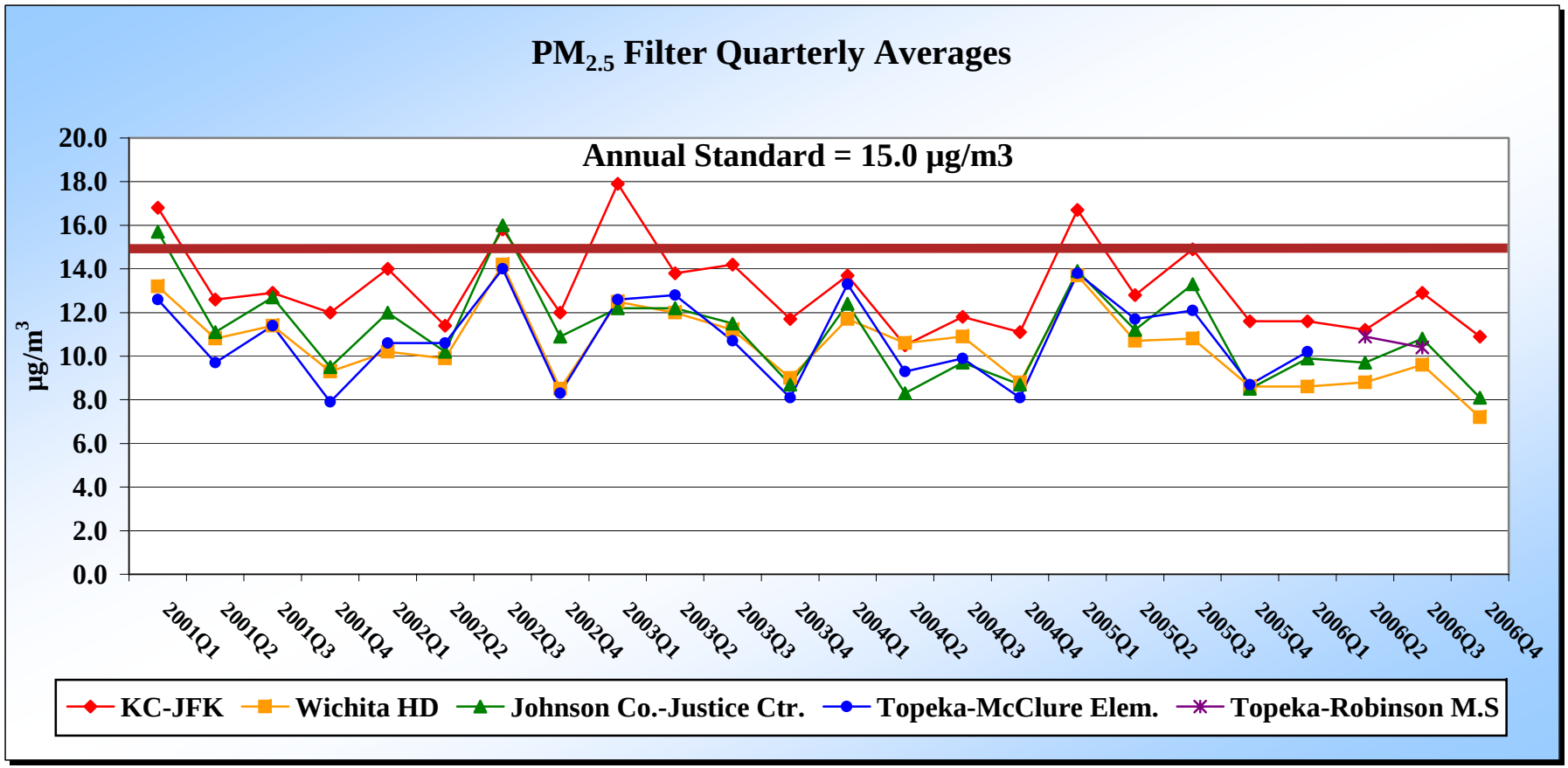


Fine Particulate Matter ($PM_{2.5}$)

The $PM_{2.5}$ standards issued by EPA in 1997 were set for two time periods, an annual average and a 24-hour average. The annual average standard was set at 15.0 micrograms per cubic meter (ug/m^3), while the 24-hour average standard was set at 65 ug/m^3. In September of 2006, EPA revised the standards for particulate matter. The new standards retained the annual average standard of 15.0 ug/m^3, and lowered the 24-hour standard to 35 ug/m^3. Graph number 6 lists the quarterly values of $PM_{2.5}$ that were recorded across the state from 2001 to 2006. The monitoring sites are JFK (Wyandotte County), Wichita HD (Sedgwick County) and Justice Center (Johnson County). In addition McClure Elementary (Shawnee County) provided monitoring data for the first quarter in 2006 and Robinson Middle School (Shawnee County) provided data for the second and third quarters.

Please see the NAAQS revision for particulate matter begining on page 24.

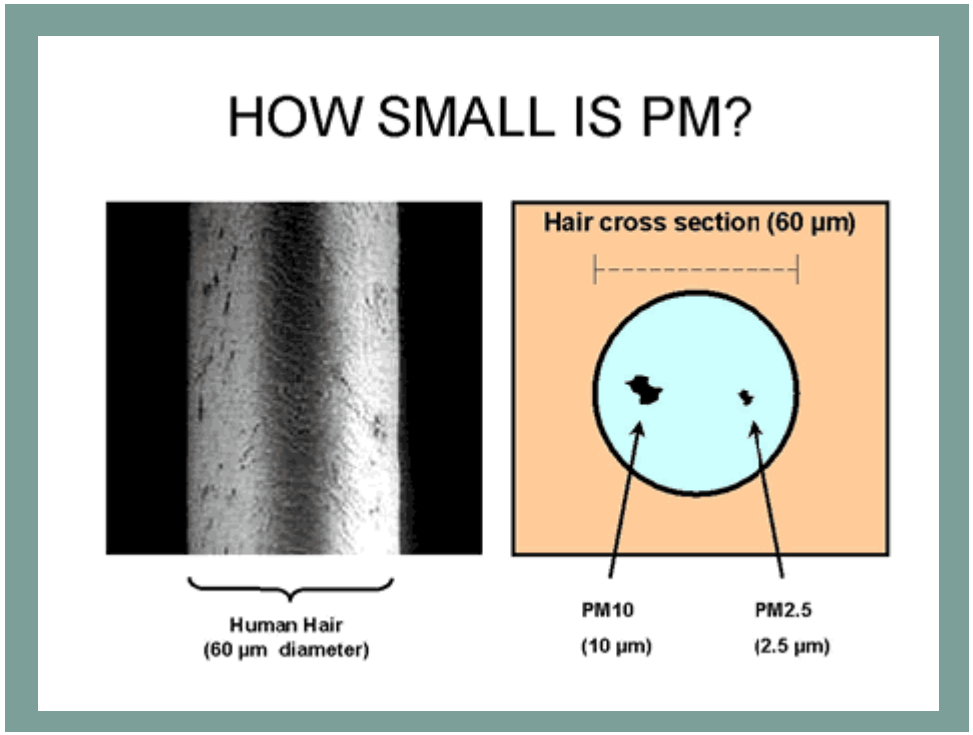
Graph 6



Particulate Matter less than 10 micrometers in diameter (PM_{10})

KDHE-BAR currently operates 14 PM_{10} monitors at 11 sites around Kansas. At this time, all PM_{10} sites in Kansas are in attainment of the National Ambient Air Quality Standard (NAAQS) for PM_{10}. The 24-hour NAAQS for PM_{10} is not to exceed 150 ug/m^3 more than once per year, on average, over a three year period. Dating back through 2000, PM_{10} levels at several monitors across the state have recorded values approaching, but not exceeding, the standard. In 2000, the PM_{10}monitor at 420 Kansas in Kansas City, Kansas, (site 20-209-0015) recorded a 24-hour PM_{10} concentration of 138 ug/m^3. And in 2003, the PM_{10} monitor in Goodland, Kansas (site 20-181-0001) recorded a 24-hour PM_{10} concentration of 126 ug/m^3. Generally, most episodes of elevated PM_{10} concentrations in Kansas can be attributed to wind-driven dust events or prescribed and/or wild land fires transporting particulate emissions to monitoring sites from downwind areas.

Please see the NAAQS revision for particulate matter begining on page 24.



NAAQS Updates for Particulate Matter and Ozone

Particulate matter standards revision

The Environmental Protection Agency (EPA) first issued National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) in 1971; and revised the standards in 1987 and 1997. In September 2006, the Agency revised the 1997 standards.

The Agency selected the levels for the final standards after reviewing thousands of peer-reviewed scientific studies about the effects of particle pollution on public health and welfare. External scientific advisors and the public examined EPA's science and policy review documents. The Agency also carefully considered public comments on the proposed standards. EPA held three public hearings and received over 120,000 written comments.

The revised 2006 standards address two categories of particle pollution: *fine particles* ($PM_{2.5}$), which are 2.5 micrometers in diameter and smaller; and *inhalable coarse particles* (PM_{10}) which are smaller than 10 micrometers and larger than 2.5 micrometers. EPA strengthened the 24-hr $PM_{2.5}$ standard from the 1997 level of 65 micrograms per cubic meter ($\mu g/m^3$) to 35$\mu g/m^3$, and EPA retained the current annual $PM_{2.5}$ standard at 15$\mu g/m^3$. EPA has decided to retain the existing 24-hour PM_{10} standard of 150 $\mu g/m^3$. Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the Agency has revoked the annual PM_{10} standard.

Kansas is currently monitoring both categories particulate pollution in Dodge City, Wichita, Goodland and Kansas City. No violations of the new standards have been recorded.

Ground-level ozone revision

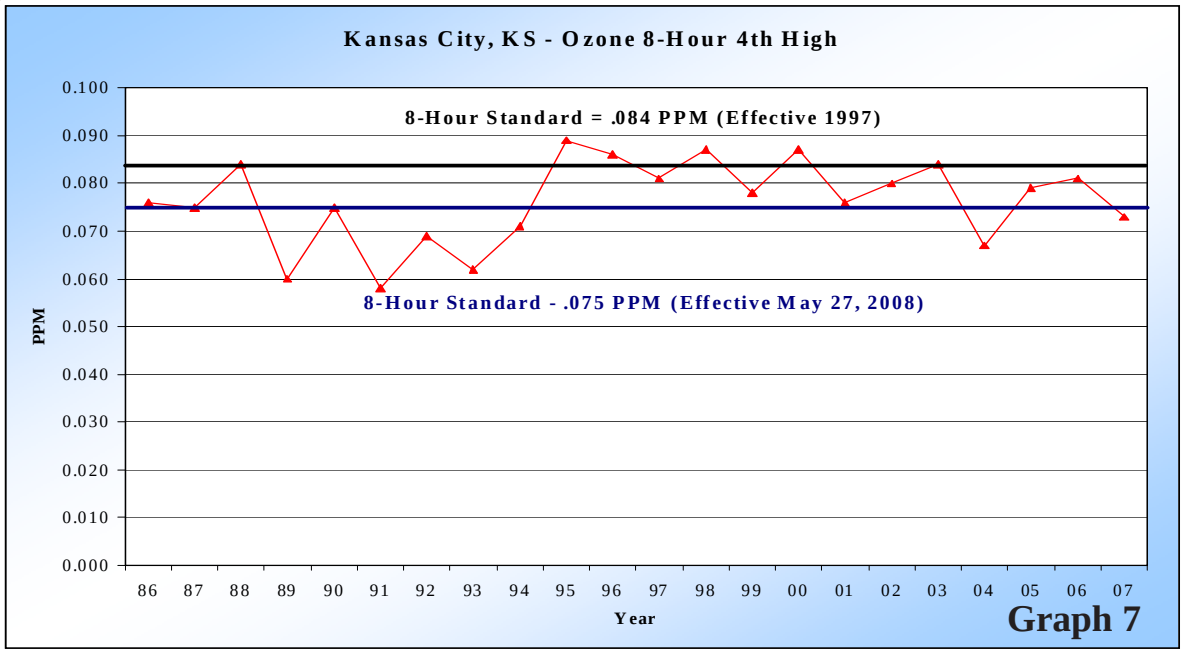
The Clean Air Act requires EPA to review the NAAQS every five years to determine whether revisions to the standards are appropriate. After evaluating the results of more than 1,700 new studies EPA concluded that ozone causes adverse health effects at levels below those set at 0.08 parts per million (ppm) in 1997. On March 12, 2008 EPA significantly strengthened its NAAQS for ozone. After the extensive data review, consideration of public comment, and comment from the Clean Air Scientific Advisory Committee the EPA is revising the 8-hour "primary" standard, designed to protect public health, to a level of 0.075 ppm. Newly available evidence strengthens EPA's confidence in previous reviews and identifies new health endpoints associated with ozone exposure. These include mortality, increased asthma medication use, school absenteeism, and cardiac-related effects. Furthermore, EPA sited data from studies of asthmatics indicating that they experience larger and more serious responses to ozone that last longer than responses for healthy individuals.

In addition, new evidence since the last review of the ozone NAAQS continues to show that repeated exposure to ozone damages sensitive vegetation, leading to reduced growth and productivity, increased susceptibility to diseases and pests, and damaged foliage. EPA is also strengthening the secondary standard to 0.075 ppm after concluding that the 1997 secondary standard is not adequate to protect sensitive vegetation. EPA estimates that the revised standard will yield health benefits valued between $2 billion and $17 billion per year in 2020. EPA estimates the annual costs of implementing a standard of 0.075 ppm would range from $7.6 to $8.8 billion.

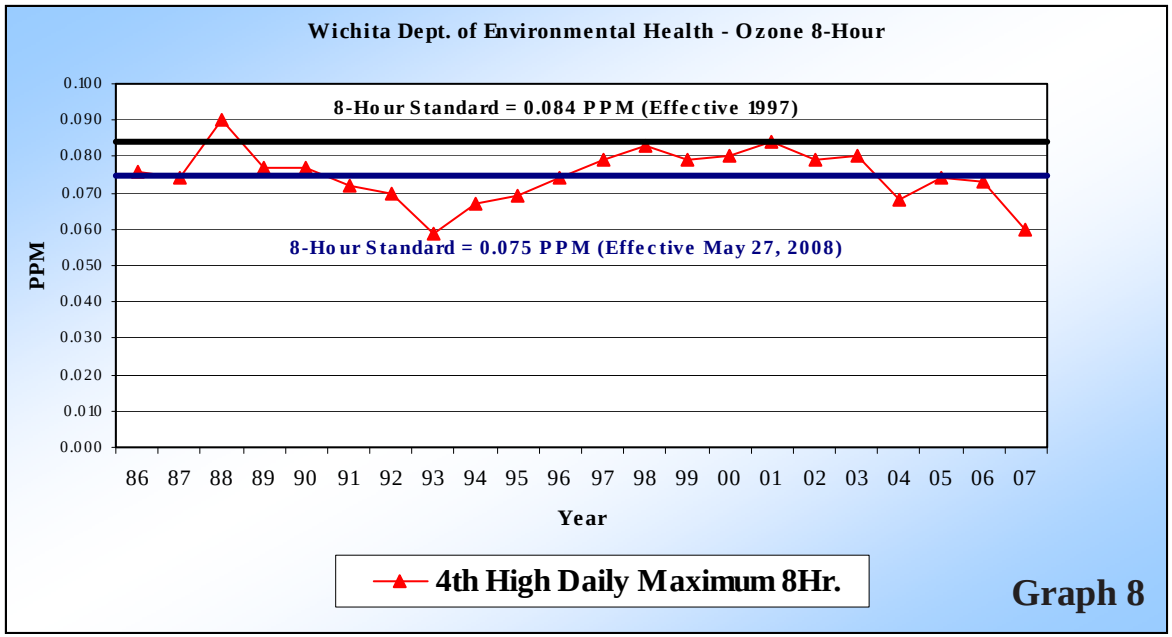
The Clean Air Act also requires the EPA to distinguish areas of the country as meeting the standard (attainment) from areas that do not (non-attainment) and also from areas with insufficient data to classify as either (unclassifiable). States must report attainment recommendations to EPA for areas where monitoring has indicated ozone exceedances by March 2009.

The Kansas City, KS area, which includes Johnson and Wyandotte counties, is part of the Kansas City Metropolitan Planning Area, including Cass Clay and Jackson Counties in Missouri. Monitoring data from Kansas and Missouri must be considered for designation purposes. Kansas City has a long history of dealing with ground-level ozone pollution beginning with non-attainment designation under the one-hour ozone standard in 1978. Since that time, the city has seen many ups and downs with re-designation as an attainment area in 1992, followed by more violations of the standards in the late nineties. In 1997, the eight-hour ozone standard was finalized at 0.084 ppm. The one-hour standard was eventually revoked. The Kansas City area came very close to non-attainment designation in 2004, but unseasonably cool temperatures during the ozone season allowed the city to remain in attainment (Graph 7). The low ozone readings from 2004 helped keep the design value, which is based on a three-year rolling average, below the standard for 2005 and 2006, even though the city's monitors exceeded the standard in excess of 25 times each of those years. In 2007 the three year rolling average does not include 2004's lower ground-level ozone reading. A violation of the standard did occur in Mid-June in 2007 which triggered the implementation of measures detailed in the State Implementation Plan for midigation of ozone. A final Kansas designation recommentation is due to EPA in 2009 and will include 2006 to 2008 ozone season data.

The Wichita Department of Environmental Health has monitored air pollution levels since the 1970's. Additional monitoring sites are located south of Wichita at Peck and north at Park City. During the 1990's, the city's ground-level ozone levels began to increase, raising concerns that the city would violate the health-based standard established by the Environmental Protection Agency (EPA). Graph 8 shows the ambient ozone monitoring trends for the monitoring site located at the Wichita Department of Environmental Health between the years of 1986-2006. While there were moderate increases in ground-level ozone levels throughout the 1990's, the city has stayed below the 8-hour ozone standard for the past six years. With the more stringent standard of 0.075 PPM in place for 2008 Wichita area monitors could record ozone exceedances and a possibly violate the health-based standard.



Graph 7



Graph 8

Kansas City Area Ozone Monitoring Network

Wichita Area Ozone Monitoring Network

Clean Air Lawn Care Outreach Program

The Clean Air Lawn Care Outreach Program (CALC) is a Kansas Department of Health and Environment initiative for affecting cleaner air for the people of Kansas. We like our lawns to look neat and our gardens to be attractive. Our efforts improve our communities and bring a sense of personal accomplishment. However, the choices we make in caring for our property can also affect our community by contributing to air pollution. Volatile organic compounds (VOCs) and nitrogen oxides (NO_x) from lawn and garden equipment (mowers, trimmers, gas cans) contribute to ground-level ozone.

The purpose of the program is to reduce air pollution from lawn and garden equipment. CALC is considered to be an "easy going approach" to lawn and garden care. The responsible practices detailed by BAR's printed material are win-win choices that save money and time spent maintaining our yards. Best of all is the benefit of better air in Kansas.

The program targets four audiences; the general public, lawn and garden equipment retailers and manufacturers, the professional lawn care industry, and large landscape customers such as government offices and private entities.

Change a Light, Change Kansas Pledge Drive

The ENERGY STAR Change a Light, Change the World Campaign is designed to bring individuals and organizations together in a nationwide effort to save energy and reduce greenhouse gases, starting by encouraging a switch to lighting that has earned the government's ENERGY STAR label for energy efficiency. In 2006, BAR became a Change a Light, Change the World Pledge Driver making a public commitment to invite KDHE staff to take the pledge to replace at least one regular incandescent light bulb with a compact fluorescent light (CFL) bulb. Final pledge count was 208 pledges, 1,290 bulbs replaced or in the process of being replaced, 363,780kWh of energy saved, $33,832 in energy costs saved, and 527,610 lbs of CO_2 emissions avoided.

Courtesy of Wichita Department of Environment Health

Partner Contact Information

United States Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101
www.epa.gov/region7

Johnson County Environmental Department
Air Quality Program
11811 S. Sunset Drive, Suite 2700
Olathe, KS 66061
www.sharetheair.com

Mid-America Regional Council (MARC)
600 Broadway, 300 Rivergate Center
Kansas City, MO 64105
www.marc.org

Shawnee County Health Agency
1615 West 8th Street
Topeka, Kansas 66606
www.co.shawnee.ks.us

Unified Govt. of Wyandotte County-KC, Kansas
Department of Air Quality
619 Ann
Kansas City, Kansas 66101
www.wycokck.org

City of Wichita Environmental Services
1900 East 9th Street
Wichita, Kansas 67214
http://www.wichita.gov/CityOffices/Environmental/AirQuality/

KDHE-Bureau of Air and Radiation Contacts:

Administration/Director	785-296-6024
Asbestos/Right to Know:	785-296-1689
Compliance:	785-296-1544
Construction Permits:	785-296-1583
Emissions Inventory:	785-296-0451
Modeling:	785-296-6429
Monitoring Data:	785-296-0451
Monitoring:	785-291-3272
Operating Permits:	785-296-1561
Radiation:	785-296-1565
Planning/Outreach	785-296-0910

Kansas Department of Health & Environment
Division of Environment
Bureau of Air and Radiation
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366
www.kdheks.gov/bar/

Kansas Air Quality Reports are available at: http://www.kdheks.gov/bar/air-monitor/index.html
To save paper please print only if necessary.

Paid for by the Kansas Department of Health and Environment